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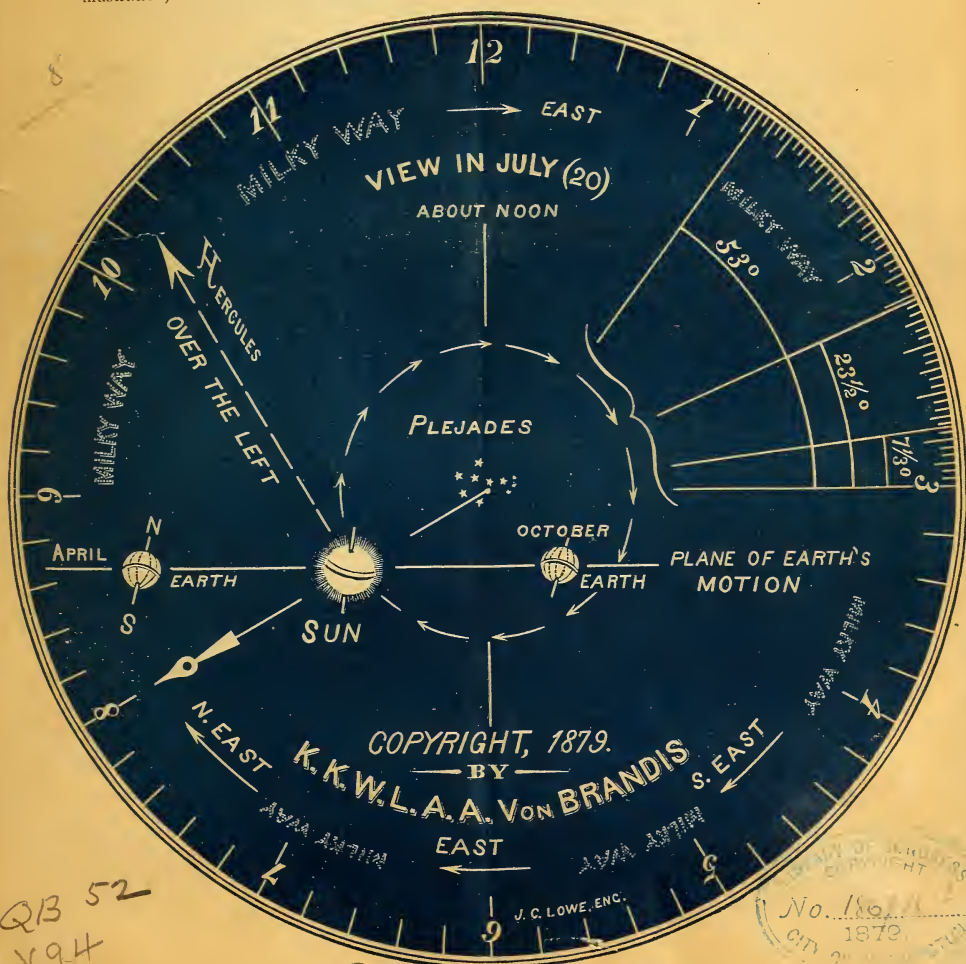
WHERE ARE WE FLOATING IN THE UNIVERSE?

IF I undertake to treat on matters referring to the Universe, I feel bound to give my ideas of the Universe generally; as well, also, on its spiritual relations. But in this Leaf I will confine myself to such universal questions as bear directly on the points indicated in the heading,

Having come to the conclusion that a plain illustration would serve very materially for a clear and positive understanding of the explanations and propositions, which I bring before the reader here below, I have undergone the labor of finding out a simple arrangement of the very complicated combination of such an illustration. This, I hope, will best serve its purpose.

On this adopted plan the Sun would look like a very small spot, almost invisible; the Earth would not be visible at all, nor even appear as a separate body; her distance from the Sun would be so small as to be not visible.

These and some other considerations have led to enlargements and displacements of parts of the illustration, so as to make it more useful.



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Bugs

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INSTRUCTION FOR USE OF DIAL.

The arrow line toward Hercules points actually toward that star-group, when the dial is in its proper position. The Sun moves toward Hercules.

About November 10 and May 10, at mean or local noon, the line to Hercules is in a vertical plane through the Sun and Earth.

On any day of the year at noon, at any spot on Earth north of the Sun, place the dial so that the line between figures 9 and 3 is in a plane through the horizontal diameter of the Sun and the observer's eye, and inclined to this plane, which I name eye-plane, with its front 53° , or figure 12, by turn of dial in line between figures 9 and 3, let forward down for 37° . The magnitude of 53° is given on the dial over figure 3.

The eye-plane represents the plane of the Earth's motion relative to the Sun.

On the 20th day of July, or about then,* the disk must face the observer's eye, and figures 9 and 3 be equally distant: every day later it must be turned around a vertical line through its centre so that figure 3 is a little nearer to the eye than figure 9. The turn of one minute mark represents 6 days, the turn of a five minute's mark represents a month.

Placing one dial flat on a table, which represents the plane of the Earth's motion, and another such dial on line 9—3, and inclined forward 53° to this plane's figure 6, one can see how to hold the dial on any day or in any month, namely: so as it appears from the proper place in the edge of the dial flat on the table. Each figure represents about the 20th day of a month, each minute mark 6 days; figures 6, 5, 12, the months July, August, January.

* The statements oscillates yet in a cone of nearly 20 degrees.

PARTICULAR EXPLANATIONS.

The watch-like dial represents *the plane in which our Sun moves* at present, in which he has moved for at least several thousands of years, and in which he will move in the future, unless occasionally, perhaps, turned off into some other plane.

The edge generally represents *the Milky-Way*, the cluster of stars to which we belong.

The centre of the Sun's curved motion and of the probably circular or spiral motion of the Milky Way, is in the star-group called the Plejades, in the shoulder of the bull.

The direction of the Sun's motion in our times is toward the star-group Hercules.

The line through the Earth and Sun, parallel to the line through 9 and 3, represents the ecliptic, *the plane of the Earth's motion* around the Sun, [on account of the progression of the Sun a spiral line]; the same line is a line in said plane between the positions of the Earth on April (20) and October (20). On July (20) the observer is right in front of the Sun here, in January (20) right behind him.

The Equator of the Sun is highest over the plane of the Earth's motion about March (10), lowest below it about September (10), in the place opposite the positions of the Earth June (10) and December (10); its inclination is $7\frac{1}{2}$ degrees.

The Equator of the Earth is on the day-side lowest June (22), highest December (22); its inclination is $23\frac{1}{2}$ degrees.

Since the two angles of these equators in a July view would appear not sufficiently distinct, they were given the full magnitude, so that the Earth, on the dial, placed in the April and October positions, would appear in June and December positions; in a September view, the Sun appearing as in a June view.

The supposed path of the Sun around the Plejades is indicated by arrows.

The three angles above figure 3, valued $7\frac{1}{2}$, $23\frac{1}{2}$ and 53 degrees, represent *the inclination* of the Equator of the Sun, that of the Equator of the Earth, and also that of the plane of the Sun's motion toward the plane of the Earth's motion.

This latter plane is fairly represented by a plane, fixed by the horizontal diameter of the Sun at mean noon and by the eye of the observer.

The angle toward Hercules is made larger as it will be reduced by the inclination of 53° .

When the dial is in the proper position, the arrow line pointing toward Hercules, points actually to that star-group, toward which we have moved since several thousand years, and will for a long while to come; thus actually showing the direction in which we move relatively to the visible part of the Universe.

According to the accounts of three astronomers. whose results are very nearly the same, the change of direction of our Sun's motion is but $\frac{1}{2}$ second of an arc a year, of which there are nearly four millions in a circuit. Since each minute mark on this dial represents 6 degrees, or 360 minutes, or 21,600 seconds, or $64,800 \times \frac{1}{2}$ seconds; it represents about 65,000 years. And since there are 60 minute marks on the disk, a circuit would last $64,800 \times 60$, or about 3,888,000, say 4 millions of years. But Maedler has calculated the Sun's circuit at about 20 millions of years. It matters not much, because, as will be shown farther below, the Sun probably does not travel a closed curve at all.

The velocity of progress is given at from 4 to 400 geographical miles a second. (1 geographical mile is 6,140 feet).

If the distance is over 300 years of light, each about 5,240,000,000,000 miles, it gives a *velocity* of as many miles in proportion *over eighty miles* a second, or about 100 English miles a second, or as fast as from New York to San Francisco in half a minute, while the velocity of the Earth relative to the Sun would require about three minutes.

A year has $365\frac{1}{4}$ days, 8,766 hours, 525,948 minutes, $31,456,890\frac{1}{2}$ seconds of time, or very nearly 24 seconds of time to each second of an arc of a circuit of the Earth.

For New York, Buffalo, Chicago and San Francisco the Sun stands in July (20) at noon about 70 degrees high; 90 degrees would be right over head; the inclination of the dial being 53 degrees, 37 degrees less than 90, the dial, in proper position, will be inclined 70 and 37, or about 107 degrees, 17 degrees more than 90; thus the actual direction, the line to Hercules, will then for the observer at noon in those places strike the ground behind the observer in a north-easterly direction under an angle of about 17 degrees, or $3\frac{1}{3} \times$ height of eye behind to the left, between 15 and 20 feet.

PROPOSITIONS.

And now I invite the reader to a view of the Universe. The Universe has no boundaries or limits. This quality, as we shall see, is of utmost importance.

Because it has no boundaries, it has no form or certain magnitude, and consequently no centre as a whole.

But any one part of the Universe has limits, is not endless or infinite: it has a form or a magnitude, and therefore a centre of form or of magnitude.

And because all space is filled with matter, how compact or how ethereal it may be, any part has also a centre of matter or of weight, or of quantity, or of gravity.

The matter of any part of the Universe is scarcely ever evenly distributed, its density is scarcely ever exactly uniform; if it happened to be uniform, then the centres of weight and magnitude would be in one common point.

In the moon these centres are 32 miles apart.

In the Earth, with fluid inside and some fluid outside, the floods make the centre of magnitude oscillate inside of a flat spheroid of a few feet in diameter, while the centre of weight probably oscillates in a space several miles wide, always from the centre of magnitude away towards Moon and Sun.

The centre of magnitude of a star-cluster will always be nearer to some of its stars, and probably nearest to some one of them; but since all the stars travel, the mutual constellations never cease to change; the centres themselves travel also. Even if a star happened to be a while in the centre of a cluster, he would move on his way, and so would the centre, their separation would soon and easily follow, as our globe passes through a comet's tail.

The centre of weight of a star-cluster will also move for the same cause.

The main law is that of mutual attraction of masses in proportion of quantity, and in inverse proportion of squares of distances.

If one part of the Universe, no matter how small, is in motion, the motion produces motion of all; no matter how insignificant such influence may be. The motions of each part are communicated and imparted to all around, and to the whole Universe in all directions, of course the strongest in the direction of the motion itself, both ways. Thus once in motion, there is no end of it, because there are no boundaries. And if the Universe is in motion, motion being the consequence of motion, it was always in motion. Thus motion has no beginning, no end, is eternal and universal.

By substituting for "part" and "Universe" the more general expressions "Finite" and "Infinite," I may be allowed to pronounce as to any particle as well as to the infinite or universal seas.

It is the Relation of the Finite to the Infinite that keeps the Seas going, keeps each and all in motion.

These mutual relations of each to each—of each to the Infinite—cause also, that every statement in astronomy, applied to actual reality, is only approximate; and that all actual figures are irrational or incommensurable.

Where we float in the Universe we can determine only in relation to some space with limits.

We can see equally far in every direction, and, therefore, an observer is always in the centre of the visible part of the Universe, no matter how fast he may float along.

All the stars we see are together less than a particle of dust to our globe or to the Sun.

And in this particle, which seems to us so immense, our Sun is like a little speck in a Lake.

In which direction the whole of several thousand star-clusters, which we can see by glasses, and of which the Milky Way is but one, move in the Universe, we can absolutely never divine.

But in which direction our Sun moves in the Milky Way, or amongst the visible star-clusters generally, we know already to some extent, as this dial shows.

The centre of weight of all the visible clusters, over five thousand, might possibly be found in our Earth, or in the Moon; but it would not stay there; in Earth or Moon, or any other star, it would pass on through it; in a minute through the Moon perhaps, and it would be ridiculous to endow the Moon for such occurrence with the title of a "Central Sun of all the visible clusters."

When those clusters were yet in a state of mist or vapor, their centre was in mist or vapor. At present the space enclosing those clusters is filled almost entirely with infinitely thin ethereal gases, while most all the masses of matter have gone on, clustering into such compact bodies, that they occupy but an infinitely small proportion of that space.

It is, therefore, very improbable that the centre of the Milky Way should ever be found exactly inside of a star, and it would very probably not long remain there.

It was once found very near the star Alcyone of the Plejades, and so they called Alcyone the "Central Sun."

The first quality of a "Central Sun" requires greatly superior mass, so much that it would have a visible or measurably superior influence over the whole circulating cluster, controlling it.

There is no such star in all the Milky Way; as to any such quality they are all insignificant; and so it is very likely with each of the other star clusters, and certainly with all of them combined, ages ago one common huge cluster or vapor.

With much more propriety one might qualify the centre-matter as "Central Ether."

The parts of the Milky Way tend to go on clustering into minor clusters, and it seems self-evident that we sooner or later take part in one of such minor clusters, and perhaps, or rather probably, our Sun does not move in a closed curve at all, but departs more and more from the centre toward a group in a growing spiral, and with increasing velocity, assuming more and more the character of a comet's path.

All the planets run in spirals around the path of the Sun.

Closing here this Leaf, I announce the next one; "*Tides and Tails.*"

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